

# The Lunchroom Project:

## A Long-Term Investigative Study

**F**rom the time they first enter school, children learn to collect information and present it graphically. In most early childhood classrooms, at some point during the year, children are polled on their favorite ice-cream flavors, pets, or colors; and in many schools, graphs of “how our class gets to school” show neat rows of buses, cars, and walking feet. As they progress through the grades, children are often asked to conduct their polls individually and to make up questions that their classmates can answer using their bar graphs or pictographs. Thoughtful teachers often ask their students to make predictions before they gather information and to write a paragraph or two summarizing their results.

By third grade, students are ready for more in-depth work. At the least, they are ready to widen their survey constituency to include other classes and other grades and to ask questions that arouse greater curiosity and have answers that are less predictable. At best, or if the students are a year or two older, they are ready to do a long-term investigative project.

### Designing a Survey

NCTM’s *Principles and Standards for School Mathematics* (2000) suggests that students should “formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them” (p. 176). The study gains

value when the topic arises from a matter that the students care about and when they “address some questions that have the potential to influence decisions” (p. 177). For the study described here, I found that my normally enthusiastic students had many complaints about the school’s lunch offerings and were eager to suggest changes. My first impulse in responding to their complaints was to



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**FIGURE 1****A final set of survey questions**

These are the questions our work will answer:

1. Which main dishes were chosen by more than half of the 54 third graders?
2. What did they choose instead of or in addition to the main dish?
3. What side dishes do third graders like?
4. What soup(s) do third graders like?

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slip into routine teacher behavior; that is, encourage them to try new foods, suggest that they write letters to the director of food services, and explain that catering to everyone's taste is difficult in a school the size of our K–12 school. Instead, partly because I was amused by their absolute certainty that they *knew* how the lunch menu should be altered, I suggested that we come up with some solid information about food preferences. We decided to ask the question “What do third graders eat for lunch?” and made plans to answer that question every school day for a month.

In any investigative study, framing the question, narrowing it to create an accurate survey tool, and figuring out an effective, realistic way to gather data that will prove useful are probably the hardest steps, but they are also filled with opportunities for learning. The students often think that conducting the survey will be simple and are eager to rule some paper into columns and get started. The teacher's job is to pose “what if” questions to elicit potential contingencies and complications from the students and to help them organize solutions to the resulting problems. The goal is for the study to allow for surprises without becoming unwieldy. A point worth remembering is that if students are sure that they know the answers to the questions they will be asking, they should ask different questions. Making predictions, though, is an important aspect of any study, and early in the project is a good time to call a class meeting and write down the students' thoughts. As

soon as students are asked, “What do you think we already know?” they will make several immediate predictions, followed by some thoughtfully expressed doubts. For example, as soon as some of my students asserted that no one liked meat entrees or soup, a few of their classmates thought of exceptions. We ended up with a two-tiered list of predictions, those that the children were sure of and those that they thought were probably true. Our final set of questions appears as **figure 1**.

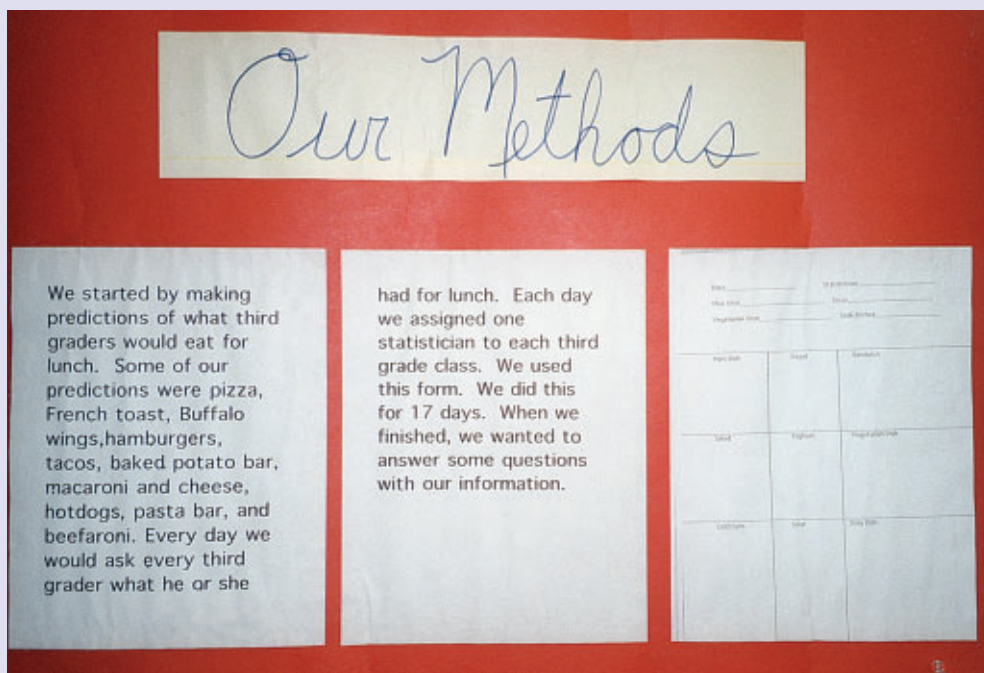
## Conducting the Survey

Deciding how to conduct the study was also harder than we initially thought. We decided to eliminate drinks from the survey because everyone found the cafeteria's beverage choices to be satisfactory. The food service offers quite a wide selection, and students are free to choose as much food as they wish. We realized that we could not simply report that a child chose a sandwich instead of the main dish, because that child might also have selected some yogurt and a side dish. Also, some foods were offered every day, including bagels, sandwiches, and the salad bar. Other foods, including the main dish, the vegetarian main dish, the side dishes, and the soup, changed daily. We knew, then, that we would have to specify what foods were offered. The students “knew” that their peers would select chicken fingers but not pot roast, french fries but not brussels sprouts. We devised a form that would



FIGURE 2

Students' predictions and the data-collection sheet



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show the date, the name of the statistician, and that day's choices at the top. Below, we included nine boxes with room for tally marks in the following categories: main dish, bagel, sandwich, salad, yogurt, vegetarian dish, cold cuts, soup, and side dish. The students' predictions and our data-collection sheet appear in **figure 2**.

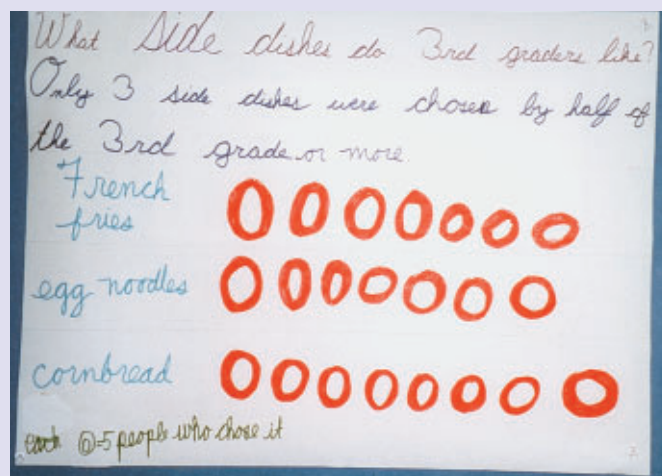
We made up a month's calendar and assigned three statisticians, one for each third-grade class, per day. At about the midpoint in the lunch period, the day's statisticians would carry a clipboard, pencil, and survey sheet to the assigned class and would put a tally mark on the survey sheet under each food item chosen. This method allowed us to ascertain quickly what food items the third graders were eating. In any investigation done over time, the investigators must decide how much time is reasonable to spend on gathering data. We knew that we needed to have enough days to cover most of the food service's repertoire of entrees. I knew that the project should not last so long that the children would become bored or we would "forget" to do it on some days and compromise its validity. We decided to conduct the survey for eighteen school days, thus giving each of my eighteen third graders a chance to gather data three times.

## Reporting the Results

The process of figuring out how to design the study was filled with opportunities for learning. After quite a bit of discussion, we realized that we could not

FIGURE 3

A graph of the most popular side dishes



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simply ask which foods children liked best, because their choices would depend on what was being offered on a given day. As we developed a method that would give results that were rich in information, we also realized that the wording of our results had to be precise if it was to be honest. In other words, we wanted to "propose and justify conclusions and predictions that are based on data" (NCTM 2000, p. 176). This requirement led us to examine language critically and take unusual care in word choice. When we began to make graphs of the results, giving



**FIGURE 4****An artistic presentation of survey results**

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the graphs accurate titles was challenging, and deciding on demarcations required logical thinking. The students answered such questions as “Are we marking by ones? Fives? Tens? What makes sense?”

We reported our results in the following ways:

1. We wrote a group report on the most popular main dishes. The results included some surprises, but in many respects, they matched the children’s predictions.

2. We made a pictograph, shown in **figure 3**, of the most popular side dishes. Side dishes are those offered at the steam table, such as corn or french fries.

3. We made a large bar graph to show how often certain foods were chosen “instead of, or in addition to,” the main dish. Because a child might take a bagel or salad in addition to fried chicken, for example, we could not really say which of these items was the child’s first choice, which is what the students had originally thought we would be able to ascertain. However, because our school would continue to offer choices and because our goal was to influence what those choices might be and how frequently they might appear, recording the information that we felt sure about still seemed valuable.

4. We found that most third graders selected soup only when the offering was chicken noodle. We decided that we would present this finding artistically. Two boys in the class made a picture of a large cauldron of steaming soup being served to lots of children (see **fig. 4**).

5. Every child wrote a letter to the director of food

**FIGURE 5****One student’s letter to the director of food services**

Dear Mr. Musillo,  
 Us 3rd graders really like Buffalo wings and French toast. Why don't you have them more often. We also like fried chicken and corn bread. Some things we like some things we don't but I'm glad you try.  
 from Margot

services. A number of their letters, including the one shown in **figure 5**, revealed a new appreciation for his job and for the reasons for offering a wide variety of food. Several children cautioned that although fries were the most popular side dish, offering them every day would not be a nutritious choice.

6. Finally, because we planned to post our findings, a group of children wrote a description of our methods and compiled a list of questions titled “What We Still Wonder,” inviting further studies. In one of their questions, the children acknowledged that older students would have different eating habits



# Students' list of extension questions

## What We Still Wonder

We wonder whether a different grade would get different results. We are pretty sure the faculty would because our teacher eats vegetables almost every day and she and the rest of the faculty are a lot older than we are.

We welcome comparison studies and comments. You can find us in room 35.

An elementary school class is a community of individuals who are thrown together for the course of a school year. Each child's learning during that year depends in part on the strength and ethic of that community. When children do big investigations, the experience of working together is not separable from the content of what they are learning; rather, both become memorable for the students.

## Reference

National Council of Teachers of Mathematics (NCTM). *Principles and Standards for School Mathematics*. Reston, Va.: NCTM, 2000. ▲

from their own, and they suggested that another grade might do a similar study (see **fig. 6**).

## Conclusion

Clearly, a project such as this one takes time, especially during the planning stages and at the end, when conclusions are drawn and reported. I also spent considerable time hanging the children's finished work in a central location to allow others in the school to see it. To justify this amount of time, the study should be intrinsically valuable and should provide a useful venue for exercising skills developed in different areas of the curriculum. The immediate worth of the study comes from posing a question that is meaningful to the children. To be meaningful, the question should be one to which the students do not already know the answer; one for which they care about the answer but are open to surprising results; and one that enables them to use the information that they obtain to have a genuine impact, or at least a realistic attempt at an impact, on an issue in their community.

In our study, the children noticed the popularity of pasta as an occasional side dish; as a result of their report, pasta became a regular alternative to the main entree. When they formulated questions, wrote reports and letters, and labeled graphs, my students gained experience in clarifying and verbalizing their ideas and expressing them effectively in writing; they also got practice in spelling, punctuation, and handwriting. In mathematics, they learned how to organize information logically and how to present it accurately in graphs. In their dealings with others, including both the peers whom they surveyed and the director of food services, who gave us his complete interest and cooperation and even showed our work to a supervisor from his company, they learned to be diplomatic and a bit more open-minded.



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